

Lab 13 - DTMF Relay

CCNA Voice Lab 13

DTMF Relay

Lab Objective:

The objective of this lab exercise is for you to learn and understand how to implement DTMF relay functionality in Cisco IOS voice gateways

Topic Description:

DTMF, or Dual Tone Multi Frequency, refers to the tones that are played when the dial pad on a phone is pressed. DTMF is often referred to as touch-tones. Because voice traffic is typically compressed, DTMF can become distorted. The DTMF relay feature allows the DTMF to be sent out-of-band, which resolves the distortion problem

Lab Difficulty:

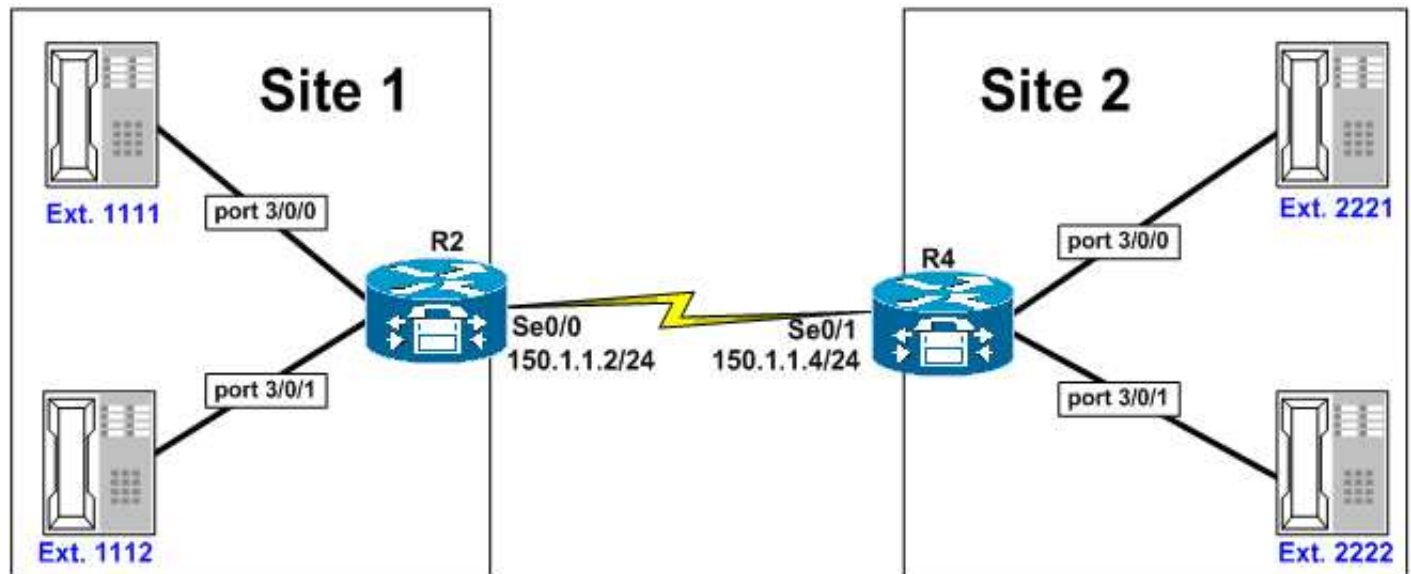
This lab has a difficulty rating of 5/10

Readiness Assessment:

When ready for your exam, you should be able to complete this lab in no more than 15 minutes

Lab Topology:

Please use the following topology to complete this lab exercise:



Lab 13 Configuration Tasks

Task 1:

Configure the hostnames and IP addresses on R2 and R4 as illustrated in the diagram. Configure R4 to provide clocking to R2. Configure the clock rate on R4 as 800Kbps

Task 2:

Configure POTS dial peers for the connected phones on R2 and R4 as illustrated in the diagram. Use any dial peer numbers you want

Task 3:

Configure VoIP dial peers on R2 and R4 for the extensions at either location. Use any dial peer numbers you want

Task 4:

IVR applications are being used at both sites; however, there are a lot of issues being experienced because DTMF tones are being sent in-band using the default DTMF relay method. To address and resolve this issue, configure DTMF relay on R2 and R4 such that tones are sent out-of-band using H.245 signaling and the length of the tone is passed along

Task 5:

Verify your configuration using the appropriate **show** and **debug** commands

Lab 13 Configuration and Verification

Task 1:

```
R2(config)#hostname R2
R2(config)#interface Serial0/0
R2(config-if)#description .Connected To R4 Serial 0/1.
R2(config-if)#ip address 150.1.1.2 255.255.255.0
```

```
R4(config)#hostname R4
R4(config)#interface Serial0/1
R4(config-if)#description .Connected To R2 Serial 0/0
R4(config-if)#ip address 150.1.1.4 255.255.255.0
R4(config-if)#clock rate 800000
```

Verify connectivity by performing a simple ping between the two routers

```
R2#ping 150.1.1.4

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 150.1.1.4, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 4/4/4 ms
```

```
R4#ping 150.1.1.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 150.1.1.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 4/4/8 ms
```

Task 2:

```
R2(config)#dial-peer voice 1 pots
R2(config-dial-peer)#destination-pattern 1111
R2(config-dial-peer)#port 3/0/0
R2(config-dial-peer)#exit
R2(config)#dial-peer voice 2 pots
R2(config-dial-peer)#destination-pattern 1112
R2(config-dial-peer)#port 3/0/1
R2(config-dial-peer)#exit
```

```
R4(config)#dial-peer voice 1 pots
R4(config-dial-peer)#destination-pattern 2221
R4(config-dial-peer)#port 3/0/0
R4(config-dial-peer)#exit
R4(config)#dial-peer voice 2 pots
R4(config-dial-peer)#destination-pattern 2222
R4(config-dial-peer)#port 3/0/1
R4(config-dial-peer)#exit
```

Task 3:

```
R2(config)#dial-peer voice 3 voip  
R2(config-dial-peer)#destination-pattern 222.  
R2(config-dial-peer)#session target ipv4:150.1.1.4  
R2(config-dial-peer)#exit
```

```
R4(config)#dial-peer voice 3 voip  
R4(config-dial-peer)#destination-pattern 111.  
R4(config-dial-peer)#session target ipv4:150.1.1.2  
R4(config-dial-peer)#exit
```

Task 4:

```
R2(config)#dial-peer voice 3  
R2(config-dial-peer)#dtmf-relay h245-alphanumeric  
R2(config-dial-peer)#exit
```

```
R4(config)#dial-peer voice 3  
R4(config-dial-peer)#dtmf-relay h245-alphanumeric  
R4(config-dial-peer)#exit
```

Task 5:

First, verify that the configuration is correct using the **show dial-peer voice** command:

```
R2#show dial-peer voice 3 | i Voice|Type|type|DTMF|dtmf  
VoiceOverIpPeer3  
  peer type = voice, information type = voice,  
  numbering Type = 'unknown'  
  DTMF Relay = enabled,  
  type = voip, session-target = 'ipv4:150.1.1.4',  
  dtmf-relay = h245-alphanumeric,  
  RTP dynamic payload type values: NTE = 101  
  Cisco: NSE=100, fax=96, fax-ack=97, dtmf=121, fax-relay=122  
  RTP comfort noise payload type = 19  
  Max Redirects = 1, signaling-type = cas,
```

```
R4#show dial-peer voice 3 | i Voice|Type|type|DTMF|dtmf  
VoiceOverIpPeer3  
  peer type = voice, information type = voice,  
  numbering Type = 'unknown'  
  DTMF Relay = enabled,  
  type = voip, session-target = 'ipv4:150.1.1.2',  
  dtmf-relay = h245-alphanumeric,  
  RTP dynamic payload type values: NTE = 101  
  Cisco: NSE=100, fax=96, fax-ack=97, dtmf=121, fax-relay=122  
  RTP comfort noise payload type = 19  
  Max Redirects = 1, signaling-type = cas,
```

Next, place a call between any number on R2 and R4 and use the **show call active voice** command and the options to ensure that H.245 alphanumeric is the DTM relay method:

```
R2#show call active voice compact  
<callID> A/O FAX T<sec> Codec type Peer Address IP R<ip>:<udp>  
Total call-legs: 2  
  5 ANS T301 g729r8 TELE P1111  
  6 ORG T301 g729r8 VOIP P2222 150.1.1.4:17486  
R2#  
R2#show call active voice | i Dtmf  
tx_DtmfRelay=h245-alphanumeric
```

Final Relevant Configuration R2:

```
R2#show running-config  
Building configuration...
```

```

Current configuration : 1569 bytes
!
version 12.4
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname R2
!
!
!
!
interface Serial0/0
 description .Connected To R4 Serial 0/1.
 ip address 150.1.1.2 255.255.255.0
 no fair-queue
!
!
!
!
voice-port 3/0/0
!
voice-port 3/0/1
!
voice-port 3/1/0
!
voice-port 3/1/1
!
!
mgcp behavior g729-variants static-pt
!
!
!
!
dial-peer voice 1 pots
 destination-pattern 1111
 port 3/0/0
!
dial-peer voice 2 pots
 destination-pattern 1112
 port 3/0/1
!
dial-peer voice 3 voip
 destination-pattern 222.
 session target ipv4:150.1.1.4
 dtmf-relay h245-alphanumeric

```

Final Relevant Configuration R4:

R4#**show running-config**

Building configuration...

```

Current configuration : 1612 bytes
!
version 12.4
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname R4
!
!
!
!
interface Serial0/1
 description .Connected To R2 Serial 0/0

```

```
description connected to R2 Serial 0/0
ip address 150.1.1.4 255.255.255.0
clock rate 800000
!
!
!
!
voice-port 3/0/0
!
voice-port 3/0/1
!
voice-port 3/1/0
!
voice-port 3/1/1
!
!
!
!
dial-peer voice 1 pots
destination-pattern 2221
port 3/0/0
!
dial-peer voice 2 pots
destination-pattern 2222
port 3/0/1
!
dial-peer voice 3 voip
destination-pattern 111.
session target ipv4:150.1.1.2
dtmf-relay h245-alphanumeric
```

